

Radiologic Case

A Young Man With Recurrent Pulmonary Infections

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A "Radiologic Case" is published in this format on a regular basis. Physicians interested in contributing to the series are encouraged to send their radiologic cases to the series' editor.

JONATHAN M. LEVY, MD
Series' Editor

A 28-year-old man was seen because of fever and malaise for two days. For ten months he had had recurrent left lower lobe infections for which he had been treated with several antibiotic regimens. One month before admission, these antibiotics were stopped because his infections had apparently resolved. He had no other major medical problems and did not smoke. On physical examination there were decreased fremitus and inspiratory crackles at the lower left hemithorax. The admission chest radiograph (Figure 1) was supplemented by a computed tomographic scan of his chest (Figure 2).

What are the findings?

What is the most likely diagnosis?

How would you confirm this diagnosis?

SEE FOLLOWING PAGE FOR DIAGNOSIS AND DISCUSSION

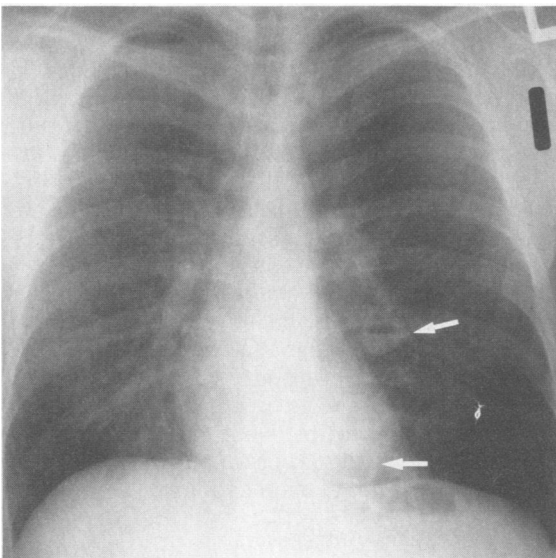


Figure 1.—A posteroanterior chest radiograph shows two cavitary lesions (arrows), one with an air-fluid level, in the lower left hemithorax. The left lower lobe is more radiolucent than the right.

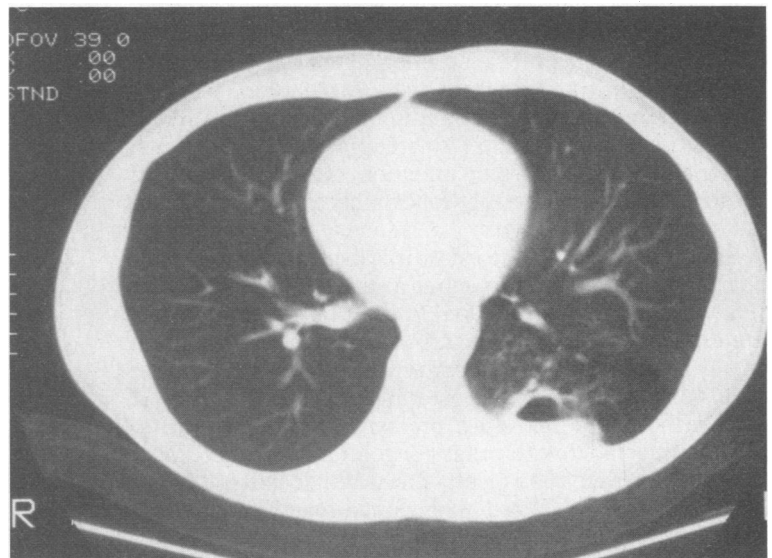


Figure 2.—A computed tomographic scan of the chest shows a cavitary lesion with an air-fluid level in the posterior aspect of the left lower lobe. Multiple cysts are seen in the surrounding lung. The second cavity was imaged lower in the thorax.

(Camargo CA Jr, Mychaliska GB, Gamsu G: A young man with recurrent pulmonary infections. West J Med 1990 Jul; 153:89-90)

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DIAGNOSIS: Infected intralobar bronchopulmonary sequestration

THE RADIOLOGIC STUDIES showed two cavitary lesions, one with an air-fluid level, in the posterior aspect of the left lower lobe, as well as hyperlucency of the surrounding lung. Although the patient carried a diagnosis of "bacterial lung abscess" and showed improvement on antibiotic therapy, the multicystic changes seemed unusual for this diagnosis. Furthermore, most cystic diseases of the lungs—such as congenital cystic adenomatoid malformation, cystic fibrosis, bronchiectasis, cavitated carcinoma—were considered unlikely given the patient's age, otherwise excellent state of health, and the well-localized nature of his infections. Congenital bronchogenic cysts remained a plausible diagnosis, although these lesions are infrequently subpleural or multiple and should not be surrounded by a hyperlucent lobe. The history and radiologic findings were most suggestive of a developmental disorder called bronchopulmonary sequestration (BPS).

Bronchopulmonary sequestration denotes an area of nonfunctioning lung tissue that lacks a normal connection with the tracheobronchial tree and that is supplied by an aberrant systemic artery usually arising from the descending aorta. Although this disorder probably represents part of a spectrum of "congenital bronchopulmonary-foregut malformations," it has proved useful clinically to consider it as a distinct diagnostic entity. Its prevalence in the general population is not known, but surgical case series have found that a focus of sequestration is encountered in 1% to 2% of all pulmonary resections. When the sequestered lung has not been aerated, bronchopulmonary sequestration presents radiographically as a well-circumscribed, homogeneous opacification. After a connection to the bronchial tree is established, usually subsequent to an infection, the sequestered lung can develop one or more air-containing cysts, with or without air-fluid levels. Air may also enter the sequestration from the surrounding lung through alveolar pores. When the connection is through small parenchymal or bronchial leaks caused by infection, chronic infection of the sequestration invariably follows because of its inadequate bronchial drainage.

Sequestrations may be classified as intralobar or extralobar depending on their pleural investment. In intralobar BPS, which accounts for about 80% of reported cases, the sequestered lung lies within the normal visceral pleura and usually drains into the pulmonary veins. The sequestration is most often located in the posterobasal aspect of the lower lobe (with a slight left-sided predominance) and is infrequently associated with other congenital anomalies. Most cases are discovered as a result of recurrent localized pulmonary infections. The male:female ratio is equal, and approximately 60% of cases present after the age of 10 years.

In extralobar BPS, the sequestered lung is wrapped in its own visceral pleura and usually drains into systemic vessels such as the azygos or hemiazygos veins. The sequestration is most often located posteriorly between the left lower lobe and diaphragm and in more than 50% of cases is associated with other congenital anomalies, especially diaphragmatic hernia. Because the extralobar segment is isolated in its own pleural sac—and therefore less likely to get infected—the typical case is discovered incidentally on a chest radiograph or during repair of an associated congenital defect.

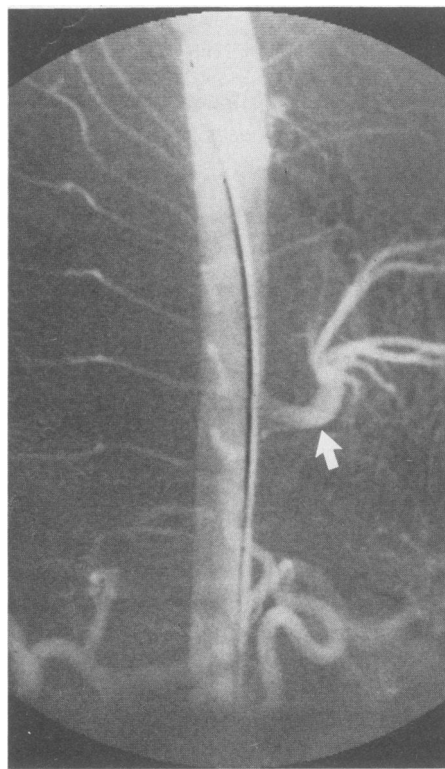


Figure 3.—A digital subtraction aortogram shows a large anomalous vessel (arrow) arising from the left side of the descending aorta to supply the left lower lobe. A selective angiogram (not shown) revealed venous drainage into the left inferior pulmonary vein and left atrium.

The male:female ratio is 4:1, and approximately 60% of cases present before the age of 1 year.

On the basis of his history and radiologic findings, the patient was tentatively diagnosed as having an infected intralobar bronchopulmonary sequestration. The definitive treatment of infected BPS is surgical excision, and an accurate preoperative diagnosis was considered essential. Aortography is diagnostic by showing the aberrant arterial supply and may also decrease the hazard of intraoperative hemorrhage through unintentional transection of these abnormal vessels. For patients with contraindications to angiography, recent reports suggest that ultrasound and magnetic resonance imaging may be effective, noninvasive methods for defining the vascular anatomy. In this patient, aortography revealed an aberrant arterial blood supply to the left lower lobe with drainage into the pulmonary vein (Figure 3) and thereby confirmed the diagnosis. After a brief course of antibiotics, the patient underwent a curative left lower lobectomy without complications.

GENERAL REFERENCES

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